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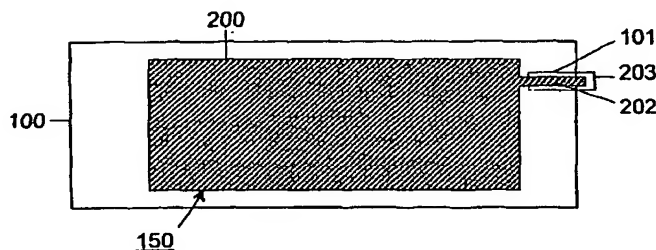
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[Continued on next page]

(54) Title: ADAPTING PORTABLE ELECTRICAL DEVICES TO RECEIVE POWER WIRELESSLY



(57) Abstract: Wireless power receiving apparatus (150) is retrofitted to a portable electrical device (100) to enable the device to receive power wirelessly. The apparatus comprises a power-receiving element (200) adapted to be attached to the device, e.g. by adhesive (201), and also being adapted to receive power wirelessly from a transmitter of power when the element and transmitter are in proximity with one another. One or more power connectors (203) are connected electrically to the power-receiving element and are adapted to be connected, when the apparatus is in use, to one or more corresponding power connectors (101) of the portable electrical device to deliver power received by the element to the device. The power-receiving element may be in the form of a sticker or may be carried by or incorporated in a replacement cover portion for the portable electrical device.

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 03/05470

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G06F1/16 H02J5/00 H02J17/00 H02J7/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G06F H02J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 96/02879 A (ELONEX TECHNOLOGIES INC) 1 February 1996 (1996-02-01) page 11, line 28 - line 4 page 33, line 1 - line 15; figure 18 -----	1,3,5,8, 11-23, 27,38
P,X	US 2003/128010 A1 (HSU PO-JUNG) 10 July 2003 (2003-07-10) paragraph [0021] - paragraph [0026]; claims 1,2,7; figures 1,6,7 -----	1,3,5,8, 11-23, 27,38
A	US 2002/099894 A1 (KOWALSKI ROBERT J ET AL) 25 July 2002 (2002-07-25) paragraph [0018] - paragraph [0024] ----- -/-	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 03/05470

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	In No.
A	US 5 455 467 A (CHEPONIS MIKE ET AL) 3 October 1995 (1995-10-03) abstract column 1, line 52 - column 2, line 41 -----	
A	WO 02/095555 A (PALM INC) 28 November 2002 (2002-11-28) abstract page 5 - page 6; claims 1,2 -----	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB 03/05470

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1, 3, 5-27, 38

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1,3,5-27,38

a wireless power receiving apparatus for use with a portable electrical device to enable the device to receive power wirelessly, the apparatus comprising:

- a power-receiving element adapted to be attached to the device, and
- being adapted to receive power wirelessly from a transmitter of power when the element and transmitter are in proximity with one another;
- one or more power connectors which, when the apparatus is in use, are connected to one or more corresponding power connectors of the portable electrical device to deliver power received by the element to the device

2. claims: 2, 28-31

a power receiving element in the form of a sticker adapted to be attached adhesively to a surface portion of a portable electrical device, the element being adapted to receive power wirelessly from a transmitter of power when the element and transmitter are in proximity with one another, and having connection means from which an electrical connection can be made to a power connector of the device.

3. claims: 4, 32-37

a replacement cover portion for a portable device, the cover portion carrying a power-receiving element to receive power wirelessly from a transmitter of power when the element and transmitter are in proximity with one another, and having connection means from which an electrical connection can be made to a power connector of the device.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 03/05470

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9602879	A	01-02-1996	EP 0767936 A1 JP 10506208 T WO 9602879 A1 US 5615393 A	16-04-1997 16-06-1998 01-02-1996 25-03-1997
US 2003128010	A1	10-07-2003	NONE	
US 2002099894	A1	25-07-2002	US 2002099895 A1 US 6244513 B1 US 6123265 A US 5979770 A AU 1352702 A CA 2368518 A1 CN 1414510 A EP 1225501 A2 JP 2002312069 A US 2002148902 A1 US 6502754 B1 US 2003116631 A1	25-07-2002 12-06-2001 26-09-2000 09-11-1999 25-07-2002 23-07-2002 30-04-2003 24-07-2002 25-10-2002 17-10-2002 07-01-2003 26-06-2003
US 5455467	A	03-10-1995	GB 2262634 A ,B	23-06-1993
WO 02095555	A	28-11-2002	WO 02095555 A2	28-11-2002